

ABSTRACT OF THE DISCLOSURE

A method and apparatus for on-line DOI rebinning for LSO PET/SPECT to improve spatial resolution, for use in a hybrid Positron Emission Tomography (PET)/Single Photon Emission Computed Tomography (SPECT) system running in PET-mode. Data acquisition hardware is used to feed a detector pair coincidence event stream to an on-line rebinner. Gamma centroid location measurements are made by rastering assumed transaxial and radial head positions and the corresponding rebinning maps for optimal back-projected image resolution. Optimal positions are found by collecting a 64-bit list mode file, assuming a crystal position as the centroid for each of the heads, defining a sequence for varying the assumed positions, making the rebinning look-up tables, rebinning the list mode data, histogramming and reconstructing the image, assessing the image resolution, recording the best resolution number and the associated trial position variables, repeating these on the next trial variable set.